

REMARKS

Claims 1-19 are pending in this application, of which Claims 1, 11 and 17 are independent. Claims 1, 11 and 17 have been amended. No new matter has been added. All claims are now believed to be in condition for allowance.

Summary

The present application addresses a problem of designing a sled module that can accommodate different brands of Hard Disk Drives (HDDs) without using flexible connection cables. The data and power connectors used on various brands of HDDs, while all the same type, are not all in exactly the same physical location on the back of the HDD housing. It is desirable for the data interface and power port on each HDD to mate directly with the corresponding ports on the circuit board. This would eliminate the need for a flexible cable to couple the data and power ports on the HDD device, thus reducing the size and number of parts on the sled module assembly.

The sled module, as claimed in the present application, can accommodate HDDs with a variety of data interface and power port positions, while providing a direct connection between the HDD and the circuit board. Differently sized spacers may be used to set the position of the HDDs so that the end connectors mate properly with the circuit board connectors. Thus, the spacers are used to shift the physical position of the HDD with respect to its mounting hardware, thereby allowing the signal connectors to remain in a fixed position with respect to the circuit board. The sled can thereby accommodate HDDs of various brands and sizes.

Claim Rejections Under 35 U.S.C. § 112

Claims 17-19 have been rejected under 35 U.S.C. § 112, second paragraph, as being indefinite with respect to the presence of the tray recited in the preamble of Claim 17. This rejection is respectfully traversed and reconsideration is requested.

As recited in the original Claim 17, the sled module was designed to be fit in a tray; the tray itself had not been claimed. However, to further the prosecution of this application, Claim 17 has been amended to remove the reference to the tray. The rejection is moot in view of this amendment and should be withdrawn.

Claim Rejections Under 35 U.S.C. § 103

Claims 1-19 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Sherry (U.S. 5,757,617) over Wakita (U.S. 5,488,538). This rejection is respectfully traversed and reconsideration is requested.

It is well accepted that for a claim to be rendered obvious, the prior art reference (or references when combined) must teach or suggest all of the claim limitations. *In re Vaeck*, 947 F.2d 488, 20USPQ2d 1438 (Fed. Cir. 1991).

According to the pending Claim 1, spacers are used to position a mass storage device within a housing such that the signal connector on the circuit board and the signal connector on the mass storage device are aligned with one another, the spacers thus permitting the sled module to mate directly with mass storage devices having signal connectors with different positional configurations. None of the cited references teach or suggest these aspects of the invention, nor do they teach its advantages over the prior art. Moreover, the cited references do not disclose directly mating the mass storage device with the signal connectors on the circuit board without the use of a ribbon cable. Thus, it is respectfully submitted that the invention as recited in the claims includes a limitation not taught or disclosed by any of the references.

Sherry describes a chassis assembly housing a plurality of modules. Small contact area guide rails in the chassis engage each module to provide alignment (Abstract, lines 1-4). Sherry does not teach or suggest spacers at all. It merely demonstrates a housing 80, a circuit board 72 and an end connector 68. The disk 60 of Sherry does have a signal connector 62, however, Sherry does not teach or suggest that drives with different connector position configurations can be accommodated in the same module.

Wakita also shows a type of chassis for mounting a disk drive within a circuit enclosure and does show a type of spacer 20, 30. However, these spacers 20, 30 in Wakita serve an entirely different purpose than the Applicant's spacers. The problem that Wakita was faced with was to accommodate different width dimensions, that is, different disk enclosure widths and locations of mounting holes. In other words, Wakita uses the spacers to accommodate HDDs having different external frame widths, but not different end connector positions.

The Examiner states that, "when using the spacers as taught by Wakita to position the mass storage device, it is required that the signal connector of the mass storage drive be aligned

to an extent so that it would mate with a connector of a circuit board.” The Applicant respectfully disagrees. Wakita does not teach or suggest directly mating the connectors of the circuit board and the mass storage drive, and there is no reason to suppose that such a connection is intended.

The Examiner further asserts that, “if this connection could not be made when placing the mass storage drive in a certain position, it would be required that the spacers or additional spacers would be used to reposition the mass storage drive so that this connection could be attained.” There is no basis for this statement and the Applicant respectfully asks the Examiner to indicate where the support for such an assertion can be found. It is well known in the art to connect mass storage drives and circuit boards using ribbon connection cables. There is no reason to suppose that Wakita intended anything other than the use of ribbon cable for the connection. Moreover, the direct mating of the circuit board and the mass storage drive is one of the advantages of the Applicant’s invention, and the Examiner must supply a motivation to modify the prior art references in the way claimed (MPEP 2143.01).

Providing a way for the disk drive and the circuit board connectors to mate directly retains the function of the ribbon cable (to wit: connecting the two), while eliminating the need for the cable itself. As stated in the MPEP 2144.04(II)(B), “omission of an element and retention of its function is an indicia of unobviousness.” *In re Edge*, 359 F.2d 896, 149 USPQ556 (CCPA 1996).

Neither Wakita nor Sherry, nor the combination of the two, teach or suggest using the spacers to position the mass storage device within the housing such that the circuit board connector and the signal connector on the mass storage device are aligned with another, thus permitting the sled module to mate directly with mass storage devices.

The Examiner states that “the claims do not obviate the presence of a ribbon cable.” The Applicant respectfully disagrees. Amended Claims 1 and 11, and the original Claim 17 explicitly recite permitting the sled module to mate directly with mass storage devices. A direct mating does not allow for the possibility of using a ribbon cable. Therefore, Claims 1, 11 and 17 are not obvious in view of the combination of Sherry and Wakita and the rejection should be withdrawn.

Dependent Claim 2-10, 12-16, 18 and 19 depend on independent Claims 1, 11 and 17, respectively, and therefore are not obvious in view of the combination of Sherry and Wakita for at least the same reasons as above.

It is apparent, therefore, to us that the prior art has no showing or suggestion of a sled housing that is adapted to be fit into a tray, such that the sled housing has mating connectors that engage corresponding circuit board portions, such that the housing has a front portion in which a mass storage device is secured on peripheral edges of the housing, whereby spacers are placed within the housing to select the spatial distance between the exterior portions of the disk drive and the housing, so as to set a position of a rear connector of the storage device in alignment with a connector mounted on a corresponding circuit board, which in turn allows different mass storage devices to be accommodated in the same sled.

CONCLUSION

In view of the above amendments and remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

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